Amendments to the claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a parameter set and a weight vector for a target receiver;

b) updating the weight vector based on an individually weighted inverse cost function, a value of which increases when power calculated as delivered to the target receiver increases and decreases~~, by an amount that depends on weighting selectable for particular non-target receivers,~~ when power calculated as delivered to non-target receivers increases<ins>, wherein calculation of the inverse cost function selectably weighs interference calculated as delivered to one non-target receiver differently from interference calculated as delivered to another non-target receiver</ins>;

c) updating the parameter set; and

d) returning to the act (b).

2-3. Canceled

4. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 1, wherein the communication system comprises a DS-CDMA communication system.

5. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 1, wherein individual weighting modifies the general inverse cost function that is represented by the following equation:

$$\text{general inverse cost function} = \frac{\text{delivered power to a desired receiver}}{\text{interference power to all proximate receivers}}.$$

6. (Previously presented) A method of generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a parameter set and a weight vector set;

b) updating the weight vector set based on an inverse cost function, a value of which increases when power calculated as delivered to a target receiver increases and decreases when power calculated as delivered to non-target receivers increases;

c) updating the parameter set; and

d) returning to the act (b),

wherein the inverse cost function is represented by the following equation in which **w** is a weight vector and **c** is a channel vector, subscript m indicates a particular m^{th} receiver while subscript k varies to reflect K total receivers addressed by the method at a particular time, A_k is an adjustment parameter for adjusting nulling effect for each receiver k, and B is an algorithm gain constant:

$$J = \frac{\left|\mathbf{w}_m{}^{\mathrm{H}}(i)\mathbf{c}_m(i)\right|^2}{\sum_{k=0}^{K-1} A_k \left|\mathbf{w}_m{}^{\mathrm{H}}(i)\frac{\mathbf{c}_k(i)}{\left\|\mathbf{c}_k(i)\right\|}\right|^2 + B}\text{; where } J = \text{inverse cost function.}$$

7. (Previously presented) A method of generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a parameter set and a weight vector set;

b) updating the weight vector set based on an inverse cost function, a value of which increases when power calculated as delivered to a target receiver increases and decreases when power calculated as delivered to non-target receivers increases;

c) updating the parameter set; and

d) returning to the act (b),

wherein the weight vector is represented by the following equation in which **w** is a weight vector and **c** is a channel vector, subscript m indicates a particular m^{th} receiver while subscript k varies to reflect K total receivers addressed by the method at a particular time, $\mathbf{\Phi}$ is a cochannel gain matrix, A_k is an adjustment parameter for adjusting nulling effect for each receiver k, and B is an algorithm gain constant:

$$\mathbf{w}_m = \arg\left(\max_{\substack{\mathbf{w}_m \\ \|\mathbf{w}_m\|=1}}\left(\frac{\left|\mathbf{w}_m{}^{\mathrm{H}}\mathbf{c}_m\mathbf{c}_m{}^{H}\mathbf{w}_m\right|^2}{\mathbf{w}_m{}^{\mathrm{H}}\mathbf{\Phi}\mathbf{w}_m}\right)\right)$$

$$\text{where } \mathbf{\Phi} = \sum_{k=0}^{K-1} A_k\mathbf{c}_k\mathbf{c}_k{}^{H} + B\cdot\mathbf{I}.$$

8. (Previously presented) A method of generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a parameter set and a weight vector set;

b) updating the weight vector set based on an inverse cost function, a value of which increases when power calculated as delivered to a target receiver increases and decreases when power calculated as delivered to non-target receivers increases;

c) updating the parameter set; and

d) returning to the act (b),

wherein the weight vector is represented by the following equation in which w is a weight vector and c is a channel vector, subscript k indicates a k^{th} receiver, K total receivers are addressed by the method at a particular time, Φ is a cochannel gain matrix, A_k is an adjustment parameter for adjusting nulling effect for each receiver k, and B is an algorithm gain constant:

$$\mathbf{w}_k = \frac{\Phi^{-1}\mathbf{c}_k}{\left\|\Phi^{-1}\mathbf{c}_k\right\|}.$$

where $\Phi = \sum_{k=0}^{K-1} A_k \mathbf{c}_k \mathbf{c}_k{}^{H} + B \cdot \mathbf{I}.$

9-11. Canceled

12. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 1, wherein the initialization act (a) comprises initializing the parameter set with an adjustment parameter selected for a particular non-target receiver according to a quality of service requirement.

13. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 1, wherein the updating the parameter set act (c) comprises updating an adjustment parameter selected for a particular non-target receiver according to a power control requirement.

14. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 10, wherein the updating the parameter set act (c) comprises updating the adjustment parameter according to the following equation wherein subscript k is an index for a particular receiver, A is a nulling depth parameter, $P^{(T)}$ reflects transmission power, C is an algorithm constant for scaling the effect of transmission power, and D is an algorithm constant based on quality of service considerations:

$$A_k = C_k\left(\frac{1}{P_k^{(T)}}\right) + D_k.$$

15. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 14, wherein $P_k^{(T)}$ is a transmission power for the k^{th} receiver that is determined by closed loop power control in which the k_{th} receiver transmits power control information to the transmitter.

16-17. Canceled

18. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 1, wherein the parameter set includes a cochannel gain matrix, and updating the parameter set act (c) comprises updating the cochannel gain matrix $\mathbf{\Phi}$ according to the following equation in which $\mathbf{c}$ is a channel vector, subscript k indicates a k^{th} receiver, K total receivers are addressed by the method at a particular time, A_k is an adjustment parameter adjusting relative effect of each receiver k, and B is an algorithm gain constant:

$$\hat{\mathbf{\Phi}} = \sum_{k=0}^{K-1} A_k \hat{\mathbf{c}}_k \hat{\mathbf{c}}_k^H + B \cdot \mathbf{I}.$$

19. Canceled

20. (Previously presented) A method of generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a parameter set and a weight vector set;

b) updating the weight vector set based on an inverse cost function, a value of which increases when power calculated as delivered to a target receiver increases and decreases when power calculated as delivered to non-target receivers increases;

c) updating the parameter set; and

d) returning to the act (b),

wherein the updating the weight vector act (b) comprises updating the weight vector according to the following equation in which $\mathbf{w}$ is a weight vector and $\mathbf{c}$ is a channel vector, subscript m indicates an m^{th} receiver, and $\mathbf{\Phi}$ is a cochannel gain matrix:

$$\mathbf{w}_m \Leftarrow \frac{f(\mathbf{w}_m, \mathbf{c}, \hat{\mathbf{\Phi}})}{\left\| f(\mathbf{w}_m, \mathbf{c}, \hat{\mathbf{\Phi}}) \right\|}.$$

21. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 20 wherein the update adjusts $\mathbf{w}_m$ towards maximizing an inverse cost which is a function of $\mathbf{w}_m$, $\mathbf{c}$, and $\hat{\mathbf{\Phi}}$.

22. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 21 wherein the maximized inverse cost is given by

$$\frac{\left|\mathbf{w}_m^{\ H}(i)\mathbf{c}_m(i)\right|^2}{\mathbf{w}_m^{\ H}(i)\hat{\Phi}\mathbf{w}_m^{\ H}(i)}.$$

23. Canceled

24. (Currently amended) A method of generating vector weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a weight vector for each receiver;

b) initializing a set of adaptation parameters;

c) generating, at the transmitter, a plurality of transmit probing signals for each particular receiver based on the weight vector and parameter set for the particular receiver and on channel estimates for each of a plurality of tracked receivers comprising a subset of the receivers of the system;

d) obtaining, from each receiver, feedback that indicates which of the plurality of corresponding transmit probing signals generated in act (c) for each receiver was received better according to a measure of signal reception quality, rather than reporting channel state information;

e) updating the weight vector employed by the transmitter for each particular receiver based on the feedback generated in act (d) for each receiver; and

f) updating the parameter set by the transmitter based on the weight vector updated in act (e).

25. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 24, wherein the updating the weight vector act (e) comprises the following sub-acts:

i) updating the weight vector periodically; and

ii) updating the weight vector upon receiving binary feedback.

26. (Previously presented) A method of generating vector weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a weight vector for each receiver;

b) initializing a set of adaptation parameters;

c) generating a transmit probing signal for each particular receiver based on the weight vector and parameter set for the particular receiver and on channel estimates for each of a plurality of tracked receivers comprising a subset of the receivers of the system;

d) generating feedback based on reception of the corresponding transmit probing signal generated in act (c) for each receiver within the subset of tracked receivers;

e) updating the weight vector employed by the transmitter for each particular receiver based on the feedback generated in act (d) for each receiver; and

f) updating the parameter set by the transmitter based on the weight vector updated in act (e),

wherein the generating the transmit probing signal act (c) comprises the following sub-acts:

i) generating a test perturbation vector; and

ii) computing an even weight, an odd weight and a data channel weight based on the test perturbation vector generated in sub-act (c)(i).

27. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 26, wherein the generating sub-act (c)(i) comprises storing a current value of the test perturbation vector and generating a new current value of the test perturbation vector, **v**, according to the following equation in which E(x) is an expected average value of x:

$$\mathbf{v} \Leftarrow \text{test perturbation vector}, \mathrm{E}(\mathbf{v}) = 0, \mathrm{E}(\mathbf{v}\mathbf{v}^{\mathrm{H}}) = 2\mathbf{I}.$$

28. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 27, wherein the updating the weight vector act (e) of claim 24 comprises computing an even weight, an odd weight and a data channel weight based on the stored test perturbation vector.

29. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 26, wherein the test perturbation vector is a Gaussian test perturbation vector.

30. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 26, wherein the computing act (c)(ii) comprises computing an even weight, an odd weight and a data channel weight according to the following equations in which **w** is a weight vector and **c** is a channel vector, **v** is any perturbation vector, β is a tracking gain constant, $\mathbf{\Phi}$ is a cochannel gain matrix, subscript *base* indicates a previous value, and subscripts *even* and *odd* denote values perturbed from a previous value:

$$\mathbf{w}_{even} \Leftarrow (\mathbf{w}_{base} + \beta \cdot \mathbf{v}) \cdot \sqrt{\frac{\mathbf{w}_{base}{}^{\mathrm{H}} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} + \beta \cdot \mathbf{v})^{\mathrm{H}} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} + \beta \cdot \mathbf{v})}};$$

$$\mathbf{w}_{odd} \Leftarrow (\mathbf{w}_{base} - \beta \cdot \mathbf{v}) \cdot \sqrt{\frac{\mathbf{w}_{base}{}^{\mathrm{H}} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} - \beta \cdot \mathbf{v})^{\mathrm{H}} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} - \beta \cdot \mathbf{v})}};$$

$$\mathbf{w} \Leftarrow \frac{\mathbf{w}_{even} + \mathbf{w}_{odd}}{2}.$$

31. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 30, wherein a weight vector interference normalization is approximated according to the following equations:

Even equation: $$\sqrt{\frac{\mathbf{w}_{base}{}^{H}\hat{\Phi}\mathbf{w}_{base}}{(\mathbf{w}_{base}+\beta\cdot\mathbf{v})^{H}\hat{\Phi}(\mathbf{w}_{base}+\beta\cdot\mathbf{v})}} \cong 1-2\beta\frac{\operatorname{Re}(\mathbf{v}^{H}\hat{\Phi}\mathbf{w}_{base})}{\mathbf{w}_{base}{}^{H}\hat{\Phi}\mathbf{w}_{base}};$$

Odd equation: $$\sqrt{\frac{\mathbf{w}_{base}{}^{H}\hat{\Phi}\mathbf{w}_{base}}{(\mathbf{w}_{base}+\beta\cdot\mathbf{v})^{H}\hat{\Phi}(\mathbf{w}_{base}+\beta\cdot\mathbf{v})}} \cong 1+2\beta\frac{\operatorname{Re}(\mathbf{v}^{H}\hat{\Phi}\mathbf{w}_{base})}{\mathbf{w}_{base}{}^{H}\hat{\Phi}\mathbf{w}_{base}}.$$

32. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 26, wherein the even and odd weight vectors are transmitted with multiplexing, where the even weight vector is applied with an even multiplex and the odd weight vector applied with an odd multiplex.

33. (Original) The method of generating weighted transmit signals with nulling as defined in Claim 32, wherein the even and odd weight vectors are transmitted with time multiplexing, where the even weight vector is applied in even time slots and the odd weight vector is applied in odd time slots.

34. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 25, wherein the updating the weight vector upon receiving binary feedback sub-act (e)(ii) comprises the following sub-acts:

A) receiving a feedback bit that constitutes the binary feedback;

B) proceeding to a sub-act C) if the feedback bit indicates an even channel, else proceeding to a sub-act D);

C) updating a base vector based on an even weight, and proceeding to sub-act E);

D) updating the base vector based on an odd weight; and

E) computing new values for the even weight, the odd weight and a data channel weight based on the base vector.

35. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 34, wherein the updating a base vector based on an even weight sub-act (e)(ii)(C) comprises updating according to the following equation wherein w is a weight vector, subscript *base* indicates the base vector value, and subscript *even* denotes a particular new selected vector value:

$$\mathbf{w}_{base} \Leftarrow \frac{\mathbf{w}_{even}}{\|\mathbf{w}_{even}\|}.$$

36. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 34, wherein the updating a base vector based on an odd weight sub-act (e)(ii)(D) comprises updating according to the following equation wherein **w** is a weight vector, subscript *base* indicates the base vector value, and subscript *odd* denotes a particular new selected vector value:

$$\mathbf{w}_{base} \Leftarrow \frac{\mathbf{w}_{odd}}{\left\|\mathbf{w}_{odd}\right\|}.$$

37. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 34, wherein the computing new values sub-act (e)(ii)(E) comprises computing an even weight, an odd weight and a data channel weight according to the following equations in which **w** is a weight vector and **c** is a channel vector, **v** is any perturbation vector, β is a tracking gain constant, $\mathbf{\Phi}$ is a cochannel gain matrix, subscript *base* indicates a previous value, and subscripts *even* and *odd* denote values perturbed from a previous value:

$$\mathbf{w}_{even} \Leftarrow \left(\mathbf{w}_{base} + \beta \cdot \mathbf{v}\right) \cdot \sqrt{\frac{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} + \beta \cdot \mathbf{v})^{H} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} + \beta \cdot \mathbf{v})}};$$

$$\mathbf{w}_{odd} \Leftarrow \left(\mathbf{w}_{base} - \beta \cdot \mathbf{v}\right) \cdot \sqrt{\frac{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} - \beta \cdot \mathbf{v})^{H} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} - \beta \cdot \mathbf{v})}};$$

$$\mathbf{w} \Leftarrow \frac{\mathbf{w}_{even} + \mathbf{w}_{odd}}{2}.$$

38. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 35, wherein a weight vector interference normalization is approximated according to the following equations in which **c** is a channel vector, **v** is any perturbation vector, β is a tracking gain constant, and $\mathbf{\Phi}$ is a cochannel gain matrix:

$$\textit{Even equation:} \sqrt{\frac{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} + \beta \cdot \mathbf{v})^{H} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} + \beta \cdot \mathbf{v})}} \cong 1 - 2\beta \frac{\mathrm{Re}(\mathbf{v}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base})}{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}};$$

$$\textit{Odd equation:} \sqrt{\frac{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} - \beta \cdot \mathbf{v})^{H} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} - \beta \cdot \mathbf{v})}} \cong 1 + 2\beta \frac{\mathrm{Re}(\mathbf{v}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base})}{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}.$$

39. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 24 wherein the updating the parameter set act (f) comprises a normalized channel estimate parameter according to the following equation in which subscripts are receiver indices, **c** is a channel matrix, **w** is a weight vector, and **Φ** is a cochannel gain matrix:

$$\hat{\mathbf{c}}_m = \frac{\hat{\Phi}\mathbf{w}_m}{\left\| \hat{\Phi}\mathbf{w}_m \right\|}.$$

40. (Previously presented) The method of generating weighted transmit signals with nulling as defined in Claim 24, wherein the updating the parameter act (e) comprises updating a cochannel gain matrix **Φ** according to the following equation in which **c** is a channel vector, subscript k indicates a k^{th} receiver, K total receivers are addressed by the method at a particular time, A is an adjustment parameter adjusting relative effect of each receiver k, and B is an algorithm gain constant:

$$\hat{\Phi} \Leftarrow \sum_{k=0}^{K-1} A_k \hat{\mathbf{c}}_k \hat{\mathbf{c}}_k^H + B \cdot \mathbf{I}.$$

41. (Currently amended) A method of generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter in communication with a plurality of receivers, and wherein the transmitter includes a plurality of antennae, the method comprising:

a) initializing a plurality of baseband transmit weight vectors and a plurality of channel estimate vectors for multiple tracked transmissions;

b) updating the plurality of baseband transmit weight vectors based on previous channel estimates for the plurality of receivers and a metric of a cross interference <u>that is selectably</u> weighted differently for specific <u>different</u> ones of the plurality of receivers;

c) updating the plurality of channel estimates based on the plurality of baseband transmit weight vectors; and

d) returning to act (b).

42. (Currently amended) A communication ~~system,~~ <u>system</u> capable of generating weighted transmit signals with nulling, comprising:

a) a transmitter <u>having a plurality of antenna elements and configured to transmit a targeted signal as weighted by elements of a weighting vector from a plurality of corresponding antenna elements, and further having computing elements that include</u>

i) an initializing module configured to initialize ~~, capable of initializing~~ a parameter set and a weight vector associated with a particular receiver that is a target of the targeted signals, and

ii) an inverse cost function calculation module configured to calculate ~~and updating the weight vector based on~~ an individually weighted inverse cost function, a value of which increases when power calculated as delivered to a target receiver increases and decreases when power calculated as delivered to non-target receivers increases, the calculation weighting interference calculated as delivered to one non-target receiver according to a first weighting value, and weighting interference calculated as delivered to a different second non-target receiver according to a selectably different second weighting value, and

iii) a weight vector updating module configured to update the weight vector based on a value of the inverse cost function determined by the module ii) ~~by an amount that is selectably weighted for particular non-target receivers, and updating the weight vector based on feedback from the receiver comparing a plurality of probing signals; and~~

~~b) a receiver, capable of providing feedback that indicates which of the probing signals is better rather than indicating channel estimates~~.

43. (Currently amended) A transmitter, capable of generating weighted transmit signals with nulling, comprising:

a) an initializer, adapted to initialize a parameter set and a weight vector ~~associated with~~ for modifying, for each of a plurality of transmit antenna elements, a targeted signal transmitted to a target receiver by the transmitter;

b) a first update device, responsive to the initializer, adapted to update the weight vector based on an ~~individually weightable~~ inverse cost function, a value of which increases when power calculated as delivered to ~~a~~ the target receiver increases and decreases by an amount that reflects, with a first sensitivity controlled by a first weighting value, interference power calculated as delivered by the targeted signal to a first non-target receiver, and reflects, with a second sensitivity controlled by a selectably different second weighting value, interference power calculated as delivered by the targeted signal to a different second non-target receiver ~~is selectably weighted for particular non-target receivers when power calculated as delivered to non-target receivers increases~~; and

c) a second update device adapted to update the parameter set in response to weight vector updates.

44. (Currently amended) An apparatus for generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a receiver, and wherein the transmitter includes a plurality of antennae, comprising:

a) means for initializing a parameter set and a weight vector associated with a target receiver for the transmitter;

b) means for updating the weight vector based on an individually weighted inverse cost function, a value of which increases when power calculated as delivered to the target receiver increases and decreases ~~by an amount that depends on weighting selected for particular non-target receivers~~ when power calculated as delivered to non-target receivers increases, by an amount that reflects the calculated power delivered to each non-target receiver as adjusted by a weighting that is selectably different for different non-target receivers; and

c) means, responsive to the updating the weight vector means, for updating the parameter set.

45. (Currently amended) An apparatus for generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a receiver, and wherein the transmitter includes a plurality of antennae, comprising:

a) means for initializing a plurality of baseband transmit weight vectors and a plurality of channel estimate vectors for multiple tracked transmissions;

b) means for updating the plurality of baseband transmit weight vectors based on a metric of a cross interference that is individually weighted such that sensitivity to interference delivered to ~~for~~ specific ones of the multiple tracked transmissions is selectably different for different tracked receivers, and on a plurality of current channel estimates for the tracked transmissions; and

c) means, responsive to the updating the weight vector means, for updating the plurality of channel estimates based on the plurality of baseband transmit weight vectors.

46. Canceled

47. (Currently amended) The method of Claim 1, further comprising transmitting a plurality of probe signals to the target receiver, wherein updating the weight vector is based on feedback from the target receiver indicating which of the plurality of probe signals is determined to have better received signal quality, rather than on feedback indicative of a channel estimate determined by the target receiver.

48. (Previously presented) The method of Claim 47, further comprising generating a perturbation vector, and generating at least a first of the probe signals by weighting a transmitted signal in accordance with a current weight vector modified as a function of the perturbation vector.

49. (Previously presented) The method of Claim 48, further comprising generating a second of the probe signals by weighting a transmitted signal in accordance with a current weight vector modified as a different function of the perturbation vector.

50. (Previously presented) The method of Claim 49, wherein the feedback indicating which of the plurality of probe signals is better indicates whether the first probe signal delivered higher or lower power to the target receiver than the second probe signal.

51. (Previously presented) The method of Claim 8, further comprising transmitting a plurality of probe signals to the target receiver during alternating periods, including first and second probe signals that are signals for the target receiver as weighted by a current weight vector modified as a corresponding first or second function of a selected perturbation vector, wherein updating the weight vector is based on feedback from the target receiver indicating whether reception is better during time periods of the probe signal or time periods of the second probe signals, rather than on feedback indicative of a channel estimate determined by the target receiver.

52. (Previously presented) The method of Claim 24, wherein each receiver is a target receiver for signals intended for it, and a non-target receiver for signals intended for other receivers, and wherein the step (e) of updating the weight vector for each receiver further comprises adjusting the weight vector to decrease interference power radiated to non-target receivers by signals intended for the target receiver.

53. (Previously presented) The method of Claim 52, wherein the weight vector for each target receiver is adjusted to maximize a ratio of power calculated as delivered by an intended signal to the target receiver, divided by a quantity that reflects power calculated as delivered by the same signal to non-target receivers.

54. (Previously presented) The method of Claim 53, wherein the quantity that reflects power delivered to non-target receivers is weighted individually to more strongly reflect power delivered to one selected non-target receiver than power delivered to another selected non-target receiver.

55. (Previously presented) The method of Claim 54, wherein (c) generating the plurality of transmit probing signals further comprises generating a test perturbation vector and computing an even weight, an odd weight and a data channel weight according to the following equations in which **w** is a weight vector and **c** is a channel vector, **v** is the test perturbation vector, β is a tracking gain constant, $\mathbf{\Phi}$ is a cochannel gain matrix, subscript *base* indicates a previous value, and subscripts *even* and *odd* denote values perturbed from a previous value:

$$\mathbf{w}_{even} \Leftarrow (\mathbf{w}_{base} + \beta \cdot \mathbf{v}) \cdot \sqrt{\frac{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} + \beta \cdot \mathbf{v})^{H} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} + \beta \cdot \mathbf{v})}};$$

$$\mathbf{w}_{odd} \Leftarrow (\mathbf{w}_{base} - \beta \cdot \mathbf{v}) \cdot \sqrt{\frac{\mathbf{w}_{base}{}^{H} \hat{\mathbf{\Phi}} \mathbf{w}_{base}}{(\mathbf{w}_{base} - \beta \cdot \mathbf{v})^{H} \hat{\mathbf{\Phi}} (\mathbf{w}_{base} - \beta \cdot \mathbf{v})}};$$

$$\mathbf{w} \Leftarrow \frac{\mathbf{w}_{even} + \mathbf{w}_{odd}}{2}.$$

56. (Previously presented) The method of Claim 30, wherein each particular receiver is a target receiver for signals intended for that receiver that are weighted in accordance with the weight vector corresponding to the target receiver, and a non-target receiver for signals intended for other receivers, and wherein the step (e) of updating the weight vector for each target receiver further comprises adjusting the weight vector to decrease interference power radiated to non-target receivers by signals intended for the target receiver.

57. (Previously presented) The method of Claim 56, wherein adjusting the weight vector to decrease interference power radiated to non-target receivers includes selectably varying the decrease of interference power to specific non-target receivers.

58. (New) The system of Claim 42, wherein

the transmitter (a) further includes

(iv) a probe signal generation module configured to generate a plurality of differently weighted probe signals to be received by the target receiver;

the weight vector updating module (a)(ii) is further configured to change weight vectors based in part on feedback from the target receiver indicating which of the plurality of probing signals was received with higher quality; and the system further comprises

(b) a receiver that includes

(i) a probe signal quality measurement module configured to measure a selected signal quality parameter for each of the plurality of received probe signals, and

(ii) a probe signal feedback module configured to prepare feedback information indicating which of the plurality of received probe signals has higher quality, according to the quality parameter measurement, for transmission to the transmitter.